

High Speed Composite p-Channel Si/SiGe Heterostructure for Field Effect Devices

Abstract of the Invention

A method and a layered heterostructure for forming p-channel field effect transistors is described incorporating a plurality of semiconductor layers on a semiconductor substrate, a composite channel structure of a first epitaxial Ge layer and a second compressively strained SiGe layer having a higher barrier or a deeper confining quantum well and having extremely high hole mobility. The invention overcomes the problem of a limited hole mobility for a p-channel device with only a single compressively strained SiGe channel layer.